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An analysis of Malawi's structural trade imbalance

by

Feston Ndekhane Chimphamba

Student Number: 201707822

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Dr Magdalene Kasyoka Wilson

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To my parents, for their unwavering belief in my quest to excel academically, and my family, for bearing with my absence.

Abstract

This dissertation analyses Malawi's structural trade imbalance by empirically testing the validity of both the simplified as well as the Thirlwall & Hussain (1982) version which incorporates capital flows for the period from 1980 to 2017. The study uses the autoregressive distributed lag (ARDL) bounds-testing approach to cointegration, which has become prominent in analysing individual country studies of the Thirlwall law. Thirlwall's law has become a favourite tool of macroeconomic analysis ever since it was first put forward by Thirlwall (1979). Thirlwall & Hussain (1982) developed an extended version of the law based on the argument that a country cannot achieve longer term growth without capital flows. The interest in studying the relationship of income, terms of trade and imports has culminated in extensive empirical literature hinging on Thirlwall's law as the basis of investigation.

The empirical results of this study show that there is a long-run relationship between imports, income and terms of trade. The results of both the basic and extended version show that the predicted economic growth for Malawi is 8.917% and 9.913% respectively. The average economic growth rate of the sample period is 3.548%. These results show that the BoP position of Malawi constrains economic growth. Policies that aim at shifting the elasticities of export and import flows will ease the pressure of the BoP constraint on output growth. Therefore, policy must focus on export-led strategies, as well as policies that aim at increasing volumes and improves quality and standards of the country's products and services. Malawi must re-organise its production structure so that manufacturing forms a great share of exports. This will increase the demand for intermediate imports, which currently form the smallest component of imports.

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Chapter 1: Introduction

1.1 Background

A central and recurring theme with which Malawi's policy-makers and researchers grapple is the country's poor economic performance. The main macroeconomic fundamentals, such as inflation, economic growth rate, interest rates and the high unemployment rate, clearly indicate that it may take decades for the country to achieve remarkable growth. Evidence shows that achieving structural change and sustainable growth requires a deliberate focus on manufacturing and value addition (McMillan, Rodrik & Verduzco-Gallo, 2014; Rodrik 2014). The performance of Malawi's manufacturing sector has persistently been inconsistent. This is despite McMillan et al.'s (2014) empirical evidence that contends that the country has experienced growth-enhancing structural change, as predicted by the theory. In the context of an open economy, exports play an important role in explaining different growth rates that occur among countries (Thirlwall, 2011). From the Kaldorian perspective, long-run economic growth is possible if emphasis is placed on demand (Dixon & Thirlwall, 1975). Exports is the only component on the demand side of the balance of payments (BoP) that can ease the BoP constraint. Current account deficits are typical in economies with a high import bill, low saving rates and high personal consumption. Malawi's imports have been growing at a faster pace than exports, risking BoP problems, which Thirlwall (1979) contends constrains output growth.

One of the characteristics of a country that has a deficit in its current account is structural trade imbalance. This is because trade in goods and services account forms a greater part of the current account (Gandolfo, 2016). A trade deficit indicates international competitiveness problems. Although Krugman and Baldwin (1987) agree that faster growth abroad helps resolve a domestic economy's trade deficit problems, this has not resulted in an increase in demand for Malawi's exports relative to the demand of foreign goods.

Common to many countries struggling to achieve sustainable economic growth, Malawi has had difficulties narrowing its trade balance because of its productive structure. As a result, the country has had to rely on capital inflows to balance the trade equation. Hausmann, Hwang and Rodrik (2007) point out that the production structure matters for economic growth. An economy that has a production structure highly skewed towards manufacturing stands to benefit greatly from international trade. This is because the international price of industrial

goods regularly increases in comparison to the international price of primary goods (Pack, 1988). In comparison, primary exporting countries generate minimal total revenues because of a persistent and regular decline of terms of trade. This trend is indeed true for Malawi, which has had declining net terms of trade due to its dependence on raw tobacco as its main export product. Another challenge that will have a bearing on the trade balance is the variation in commodity prices and export earnings. Lewis (1989) has argued that, given that most countries are price takers, fluctuations in prices cause instability in the primary product markets. Gagnon (2007) has shown empirically that exporting a wider array of high-quality goods correlates positively with the GDP growth rates of the exporting country.

Malawi's exports are dominated largely by raw tobacco. For instance, the tobacco leaf exported amounted to 46.74% of total exports in 1980. Currently, the share is 56.2% of total exports. The product accounts for 70% of foreign exchange earnings. Malawi's share of world exports has been increasing steadily, from 3.4% in 1980 to its most recent share of 5.63% in 2017. Almost all the tobacco produced is absorbed by the world market. Tobacco foreign exchange earnings are the main driver of economic growth (Government of Malawi, 2012; Persaud & Meade, 2009). The exclusion of tobacco from the economy's export products greatly affects the trade balance. Therefore, the importance of tobacco cannot be overstated.

The widening gap between imports and exports has been associated with the high costs of importing petroleum and fertilisers (Government of Malawi, 2012). In 2011, Malawi's exports were half the value of its imports. A comparison of export growth and import growth between 2011 and 2016 shows that exports had a slow growth of 6.4%, as compared to imports which grew at 8.4%. This explains why, in 2013, imports were already 3.6 times the value of exports (International Trade Centre [ITC], 2018).

The dependence on raw materials for exports has contributed to the country's vulnerability in terms of international competitiveness. According to Reinert (2007), a country's production structure is critical to its competitiveness. An economy that depends on agriculture and the production of raw materials experiences deteriorating terms of trade over time, while an economy that relies on industrial products experiences improved terms of trade over time. In general, Malawi's terms of trade have been fluctuating (Figure 1.1). Baxter and Kouparitsas (2000) observes that fluctuations of terms of trade occur when an economy exports one

basket of products (unprocessed tobacco in the case of Malawi) and imports a wide range of products.

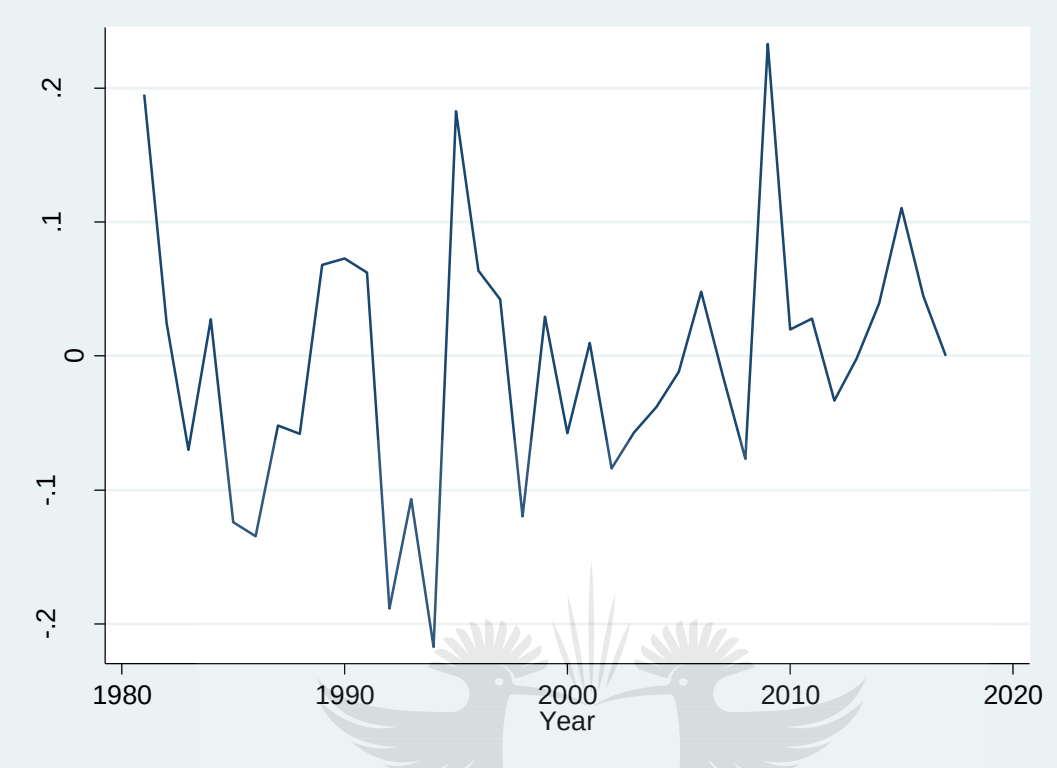

Figure 1.1: Malawi's net barter terms of trade (annual % change), 1980 to 2017 (World Bank, 2018)

Figure 1.2 shows Malawi's GDP growth rate from 1980 to 2017. In 1981, the negative growth rate was largely attributed to the national economic crisis that began in the late 1970s. According to UNCTAD (2012), the major source of this crisis was the macroeconomic policy shift by major industrialised countries. Furthermore, the effects of the international oil crisis of 1973, and the fall in primary commodity prices and trade volumes are other factors that contributed to the crisis. As a way of revamping the economy, in 1990, Malawi implemented measures that include price deregulation, rationalisation of public enterprises, removal of food subsidies and export diversification (Harrigan & Said, 2000). External shocks, inconsistent implementation of policy reforms and the static, narrow production structure made the policy impact not to be successful.

The dependence of Malawi's GDP growth on agriculture that is dependent on rainfall and weather conditions became manifest in 1992 and 1994, when severe droughts resulted in a decline of real GDP. The sharp decline that was experienced in 1992 and 1994 was because

of reduced exports due to the drought, which affected agricultural productivity. The 2001 situation was attributed to a severe food crisis, which was a result of insufficient rainfall and problematic agricultural policies (Food and Agriculture Organization [FAO], 200f2).

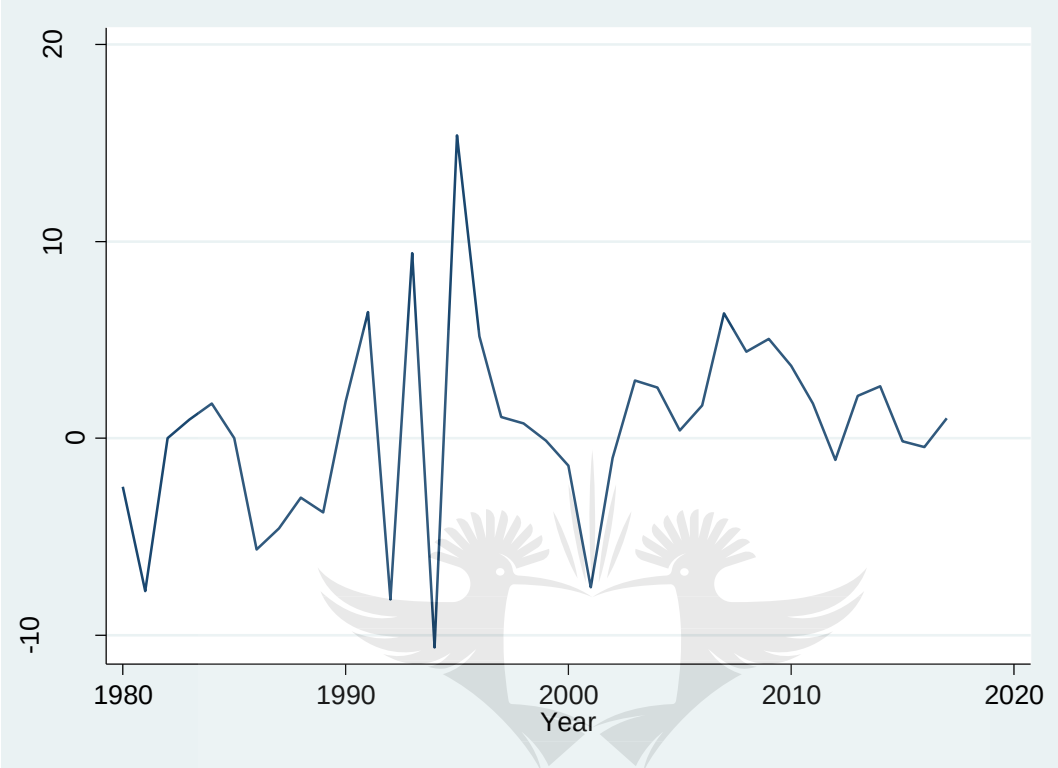

Figure 1.2: GDP per capita growth in Malawi (annual % change), 1980 to 2017 (World Bank, 2018)

1.2 Problem statement

Malawi has failed to pursue numerous export opportunities, largely due to its narrow productive structure. The economy is mainly dependent on tobacco which generates approximately 50% of foreign earnings. Attempts to diversify from this limited productive structure have met challenges, such as low technology absorption, high interest rates, rising inflation and high transport costs due to the landlocked nature of the country. From the standpoint of international trade, terms of trade, production structure as well as the trade balance affect the evolution of the country's national income.

According to the International Monetary Fund ([IMF], 2009), the current account, which is a component of the BoP, forms an important economic aggregate in the analysis of a country's international trade imbalance. Figure 1.3 presents the nature of the current account, and the trade balance of goods and services for Malawi from 1980 to 2017. As expected, trade in

goods and services is the largest of the three subcomponents of the current account. Malawi has had a current account deficit running at an average of 5% of Gross Domestic Product (GDP). The total imports of goods and services have been greater than the total exports of goods and services, generating a negative trade balance. The trade deficit has been persistent, forcing the economy to borrow to finance its import requirements.

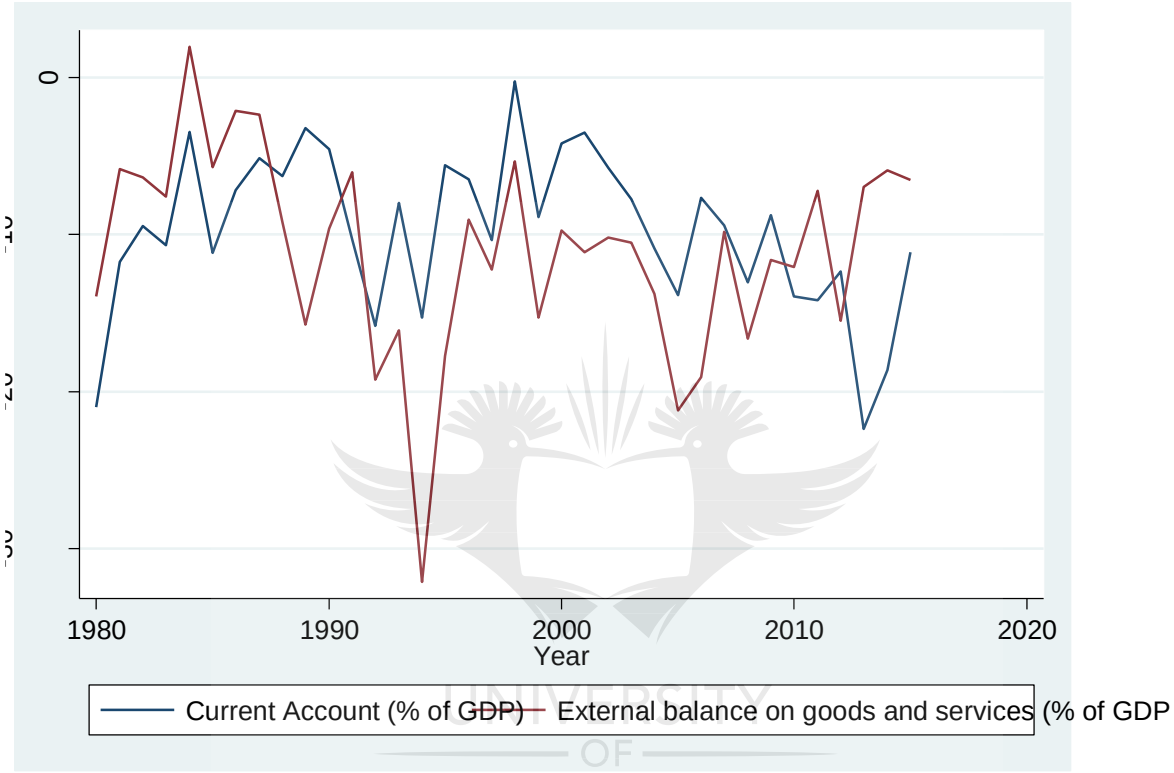

Figure 1.3: Current account and trade balance in Malawi, 1980 to 2017 (World Bank, 2018)

The analysis of the worsening trade balance of Malawi has been examined from various theoretical viewpoints. Mataya and Veeman (1997) tested the J-curve hypothesis. Their results show that trade balance improves through real exchange rate changes when there is a currency devaluation. Musila (2002) estimated the export and import demand functions of Malawi between 1967 and 1996. The study concludes that there is a short-run trade balance deterioration in exchange rate depreciation, which does not really improve the trade balance in Malawi's situation, and that the Marshall-Lerner condition consequently is hardly satisfied.

Various empirical studies on the BoP-constrained growth model have convincingly attempted to empirically establish the influence of BoP movements on rates of economic growth. These studies support the BoP-constrained growth hypothesis. There is overwhelming evidence that real exchange rate changes are not an efficient mechanism for adjusting BoP. The BoP

equilibrium is maintained by income adjustments (Thirlwall, 2011). The study by Perraton (2003) is the only known study of developing countries that has tested Thirlwall's law including Malawi in the sample for the period 1973 to 1995. The study used error correction techniques and long-run elasticities. Long-run income elasticity of demand for imports for Malawi was found to be 1.14 and the predicted income was 2.73%. Perraton (2003) concludes that these estimates are unreasonable. A possible explanation is that Malawi may have been amongst the countries that suffered intense economic disturbances between 1973 and 1995. Also, the country was going through a structural change process. Trade policy changes, for example the implementation of import substitution industrialisation policies, also contributed to the instability of the demand functions.

The focus of this dissertation is therefore to empirically explore the validity of Thirlwall's Law in Malawi regarding whether the economy's BoP is growth-constrained or not. The main argument advanced by this study is that the characteristics of products that an economy imports and exports influences the income elasticity of demand of the country's exports and the country's propensity to import. This has an implication for the trade balance. It is evident that what a country produces and exports, its balance of trade, and consequently its economic growth, are interrelated items. Demand-oriented theories provide various perspectives for empirically studying the relationship (McCombie & Thirlwall, 1994). Thirlwall's Law has become the most intuitive theory to empirically test the strength of an economy's imports in relation to its economic growth rate, as well as the nature of its terms of trade.

This study will test the Post-Keynesian theory of BoP to understand the correlation between Malawi's growth rate and the growth rate of its imports using data from 1980 to 2017. The use of robust time-series techniques is utilised, specifically the auto-regressive distributed lag (ARDL) bounds-testing approach. This dissertation argues that the econometric study previously employed for Malawi was used for several countries. Therefore, an individual country methodology spanning the period from 1980 to 2017 may check the model's explanatory power for the Malawian economy. The extended version of the law developed by Thirlwall and Hussain (1982) is used to confirm the long-run relationship between Malawi's GDP growth rate, export volume and income elasticity demand for imports. The extended version includes capital flows and terms of trade changes in the model. These two factors are assumed to cause deviations from the basic law, which divides the export volume by income elasticity of demand for imports to arrive at the predicted growth rate. The extended version is more appropriate for developing countries. The version provides a comprehensive

analytical framework that assists in answering pertinent development economics questions. The important issues that this model addresses include export promotion and the promotion of value-added products, effective foreign aid utilisation and gap financing, debt relief and poverty reduction and financial liberalisation policies, and the financial vulnerability of developing countries (Hussain, 1999).

1.3 Research question

This dissertation aims at answering a specific question: Is Thirlwall's law valid for Malawi's economy for the period from 1980 to 2017?

1.4 Objectives of the study

The objective of this study is to empirically establish the validity of Thirlwall's law for the Malawi economy.

1.5 Significance of the study

Many studies have been done to test Thirlwall's law. However, in the case of Malawi, the only known study is a cross-country study involving many countries. We did not come across any individual country study on Malawi. A single country study on Malawi is important because it takes into account Malawi's unique characteristics and also permits the use of a different methodology to the one used in a panel setting. Hence, this study adds knowledge to the body of literature on country-level analyses of Thirlwall's law in developing countries, specifically for Africa. The results of the study are expected to ignite more debate on the applicability of the law to Malawi. The results of this study will inform policy makers and add empirical evidence to the applicability of Thirlwall's law.

1.6 Organisation of the study

The dissertation is organised as follows. Chapter 1 presented the background, problem statement, research questions, research objectives and significance of the study. Chapter 2 provides a historical background to Malawi's economy. Chapter 3 reviews the literature on BoP as well as the theoretical model that forms the basis of this study, that is the BoP-constrained growth model. Chapter 4 outlines the empirical framework. Chapter 5 presents and discusses the empirical results. Conclusion of the dissertation is provided in Chapter 6.

Chapter 2: The Historical Background to Malawi's Economy

2.1 Introduction

The chapter focusses on providing a brief historical overview of Malawi's economy. The overview is necessary to the understanding of the evolution of the economy's growth rate, as well as the behaviour of its imports and exports. The chapter dwells much on the impact of policy on domestic income, imports and exports, because these are key variables when analysing the BoP constraint using Thirlwall's law.

2.2 Historical overview of Malawi's economy

The development trajectory of Malawi since 1964 is categorised into five phases. The phases are: (i) rapid economic growth phase (1964 to 1978), (ii) liberalisation phase (1979 to 1995), (iii) crisis phase (1996 to 2003), (iv) stabilisation and enhanced growth phase (2004 to 2009) and (v) economic deterioration and plummeting growth phase, beginning 2010 (Booth, Cammack, Harrigan, Kanyongolo, Mataure & Ngwira, 2006; Said & Singini, 2014). The following paragraphs outlines these phases.

2.2.1 Rapid economic growth phase (1964 to 1978)

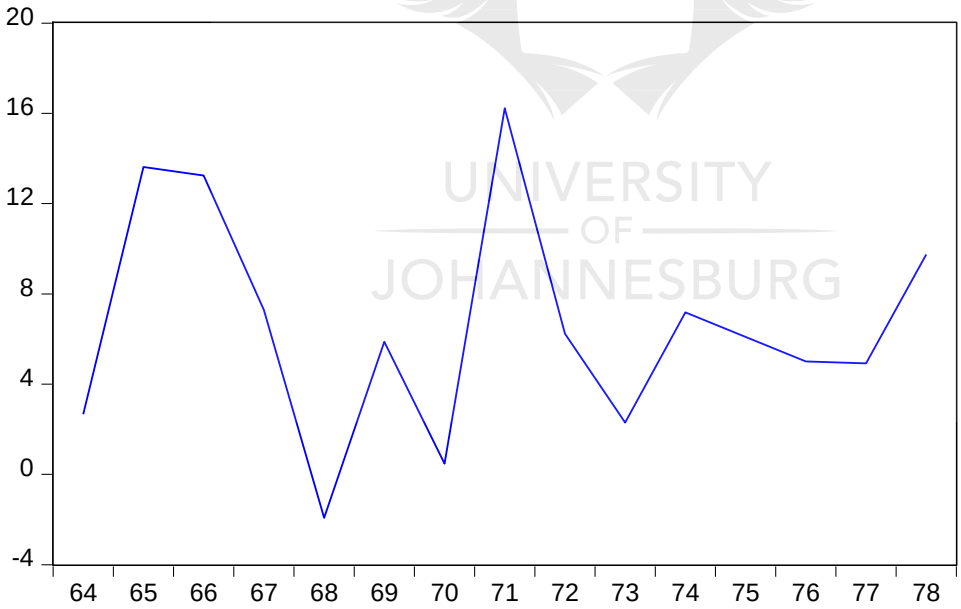

Figure 2.1: Real GDP growth in Malawi (annual % change) between 1964 and 1978 (World Bank, 2018)

As can be seen in Figure 2.1 above, from the initial year of 1964 to 1978, Malawi achieved remarkable growth, which is attributed to the agricultural sector (World Bank, 1981). The estate sector, with vast quantities of available arable land, was the main contributor to the

sustainable GDP growth of 5.5% per annum on average. Public investment was highly prioritised, at about two-thirds of total investment (Lea & Hanmer, 2009).

2.2.2 Liberalisation phase (1979 to 1995)

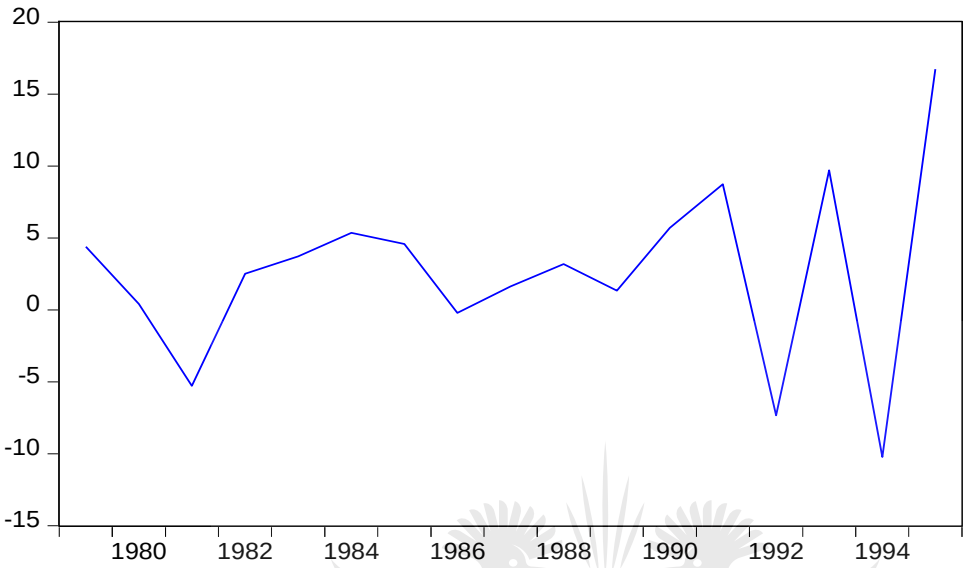

Figure 2.2: Real GDP growth in Malawi (annual % change) between 1979 and 1995 (World Bank, 2018)

According to Mulaga and Weiss (1996), one of the pioneering countries of the structural adjustment programme (SAP) in sub-Saharan Africa (SSA) is Malawi, which implemented the first programme in 1981. The precursors of this early liberalisation comprised both external and internal factors. The external environment relates to the terms of trade, which shifted unfavourably for the Malawi economy as evidenced by a fall in prices of traditional export products, namely tobacco, tea and sugar (World Bank, 2004).. The world market also faced an oil crisis in 1973/1974 due to a sudden rise in prices and a decrease in supply (Balassa, 1985). Lea and Hanmer, (2009) attribute the 25% fall of Malawi's terms of trade to the 1979 oil crisis. The war in Mozambique (1985 to 1992) had a negative impact on the economy as shown in Figure 2.2 because it destroyed the transport infrastructure on which Malawi relied. For example, the Nacala and Beira ports were closed, pushing up Malawi's transport costs of exporting and importing goods (Lea & Hanmer, 2009).

Internally, the drought of 1980 and 1981 led to a considerable drop in agricultural output, leading to a drop of export volumes. The second adjustment programme took place in the 1984/1985 financial year. Malawi was the first country in SSA to receive support under ESAF. Although shocks were eased by the first programme in 1981, the ease was just

temporary. The continued war in Mozambique in the 1980s led to the complete closure of the Mozambican corridor, which arguably is the cheapest and quickest access for Malawi to international trade.

Before liberalisation in 1981, there were maximum export restrictions; no maize, petroleum and groundnuts were exported, as these products were specially classified for the domestic market. In the same vein, tobacco, animal hides and skins required specific duties. The Reserve Bank of Malawi made it mandatory for exporters to surrender their exports earnings to bank (RBM, 2016). In 1988, the export regime was liberalised. Although export requirements were liberalised, the exportation of tobacco still required an export licence and local sales were done on the auction floor (Mbekeani, 2013).

2.2.3 Crisis phase (1996 to 2003)

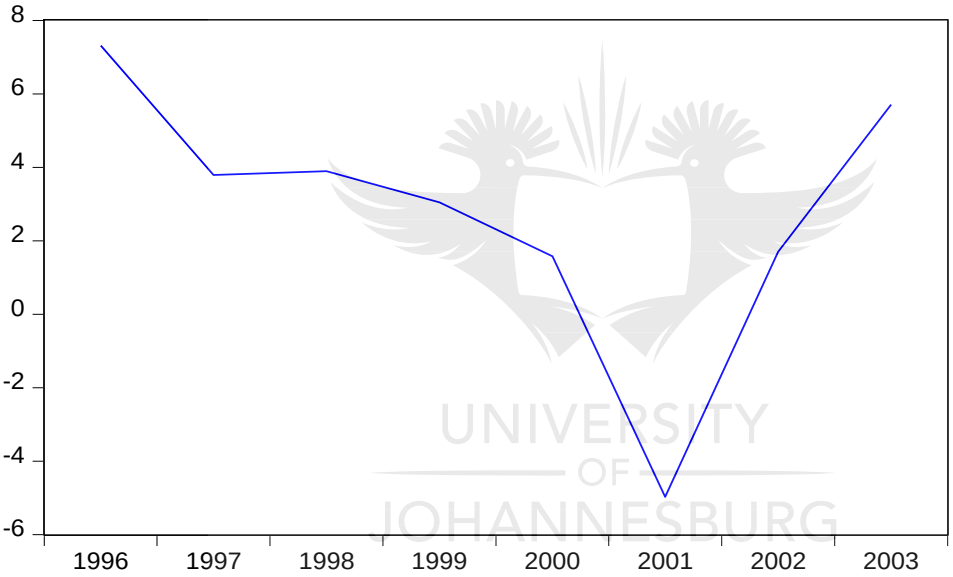

Figure 2.3: Malawi GDP real growth (annual %) between 1996 and 2003 (World Bank, 2018)

During this crisis phase, liberalisation continued, most notably the repeal of the Special Crops Act, which allowed smallholder farmers to export crops (Said & Singini, 2014). As observed by Lea and Hanmer (2009), this reform resulted in the share of the smallholder production sector in total export crop production to increase from 1990 onwards to 70%, in comparison to almost zero production until 1990. There was no corresponding policy initiative to reform the market system to channel this smallholder output, hence productivity remained low (Cammack, 2004). This phase was also characterised by frequent crises and a sharp fall in most development indicators. The most obvious sign of economic crisis faced by Malawi was the escalating trade imbalance. The economy experienced large fiscal deficits, price instability and a rise in inflation to a record of 83%. Annual GDP growth was negative

(Figure 2.3). Due to the high level of corruption, budgetary support by the IMF was reduced significantly. According to the OECD (2013), foreign aid stood at 39% of GDP in 1994, but fell significantly to 14% of GDP in 2003.

2.2.4 Stabilisation and enhanced growth phase (2004 to 2009)

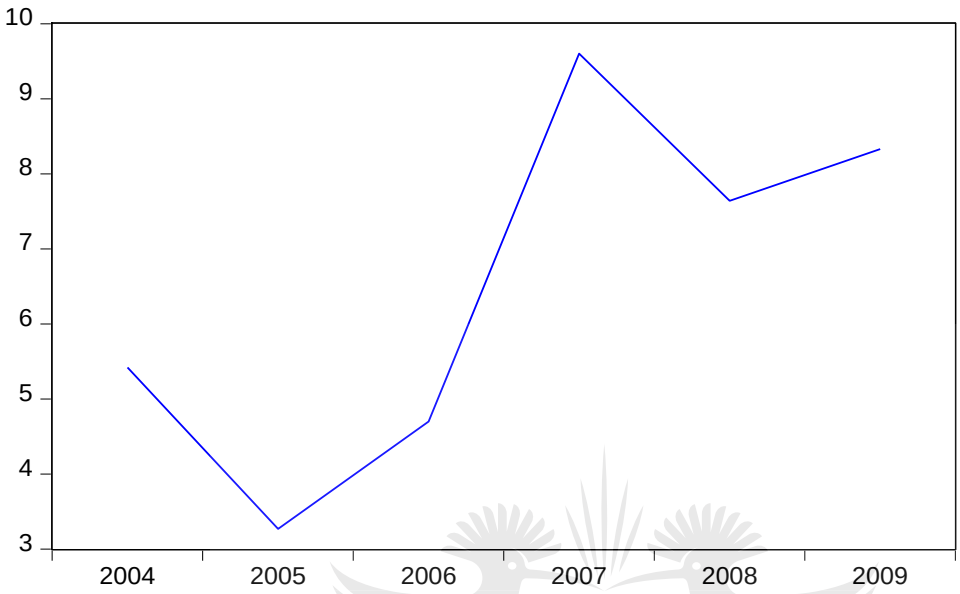

Figure 2.4: Malawi GDP real growth (annual %) between 2004 and 2009 (World Bank, 2018)

The stabilisation and enhanced growth period is characterised by macroeconomic stability and fiscal discipline. The economy registered a rapid real GDP growth as shown in Figure 2.4. The executive arm of the Malawi government centralised rent-seeking in its office, a departure from a free-for-all approach that was practised by the preceding regime. There was increased engagement with the private sector. The development of the Malawi Economic Growth Strategy (MEGS) is one example of a product of the engagement with the private sector. There were other series of important events that ensured a favourable macroeconomic scenario, such as the introduction of the Farm Inputs Subsidy Programme (FISP), coupled with good weather, which ensured good yields in both food and cash crops. Placing exchange rate above the market equilibrium is considered as the main determinant of growth acceleration experienced from 2006 onwards. The economy saw a rise in a moderation of inflation, which averaged at 10%. Another contributing factor was the cancellation of debt through the Highly Indebted Poor Country (HIPC) debt relief programme of the IMF and World Bank. The debt repayment before the cancellation was 9.6% of national income (World Bank, 2006). This might have explained the import consumption boom, mainly from import items (such as automobiles and equipment for construction), which was experienced during this period (Said & Singini, 2014).

2.2.5 Economic deterioration and plummeting growth phase (2010 to 2016)

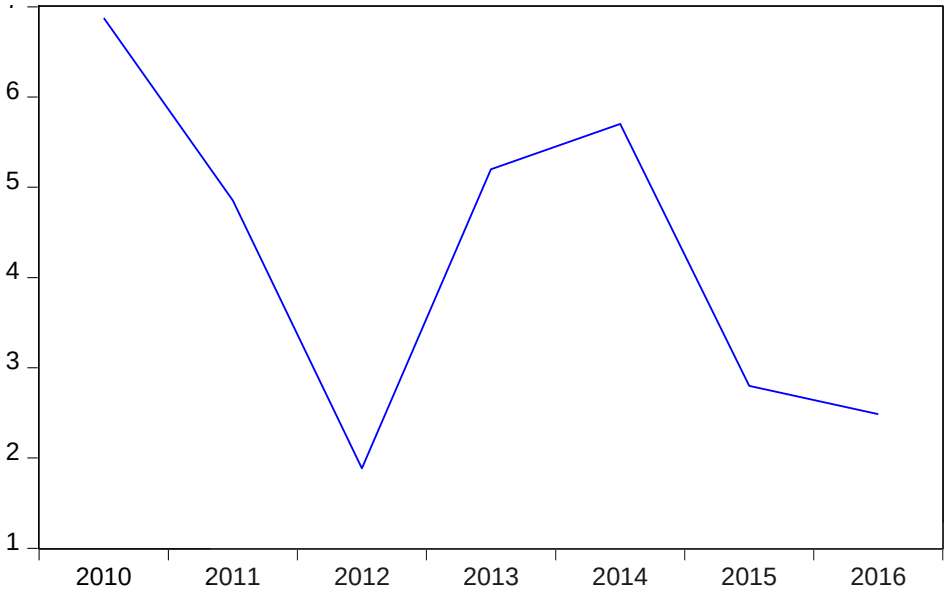

Figure 2.5: Malawi GDP real growth (annual %) between 2010 and 2016 (World Bank, 2018)

The 2011 foreign exchange crisis is mainly attributed to exchange rate overvaluation. The overvaluation of the exchange rate was done to finance the FISP and sustain lobbies. The other reasons for the crisis were structural trade deficit (which was at worrisome levels in 2010, when import values were double that of exports (Government of Malawi, 2012)), and aid cuts resulting from the authorities' departure from a developmental stance to succession politics. Malawi should not have deviated from the developmental state approach, as the success stories of East Asia (China, South Korea, Taiwan and Japan) and Africa (Ethiopia and Rwanda) are clear examples of the developmental state model as a tool of achieving high economic growth rates (Clapham, 2018). Instead, Malawi's growth after the abandonment of the developmental state was undermined because of the less liberal economic policy that was adopted. Because of extensive foreign exchange shortages, a large parallel foreign exchange market emerged, which made it impossible for foreign exchange to be accessed legally (Cammack, 2004). Rent-seeking emerged, which defeated ambitions of bolstering the manufacturing and agro-processing sectors. Eventually, annual economic growth tremendously declined from 9% in 2009 to 1.9% in 2012 (Figure 2.5). There were chronic shortages of imported goods such as fertiliser, fuel and medicine. In response to the acute foreign exchange crisis, the distortionary policies were reversed in 2012. Policy returned to the flexible exchange rate regime, and the Competition and Fair-Trading Commission (CFTC) was operationalised. However, growth constraints remained underpinned (Said & Singini, 2014).

2.3 Conclusion

This chapter has given an overview of the economy of Malawi from 1964, when the country gained independence from Britain, to 2016. The growth trajectory was discussed by categorising growth into five phases, namely: (i) the rapid economic growth phase (1964 to 1978), (ii) the liberalisation phase (1979 to 1995), (iii) the crisis phase (1996 to 2003), (iv) the stabilisation and enhanced growth phase (2004 to 2009) and (v) the economic deterioration and plummeting growth phase, beginning in 2010. The discussion generally concentrated on exports, imports, terms of trade and domestic growth, because these are key variables in the analysis of an economy using Thirlwall's law. Based on the overview, it is clear Malawi has not had consistent growth, and this is mainly attributed to policy reversals.

Chapter 3: Literature review

3.1 Introduction

This chapter reviews theories of BoP adjustment mechanism and the BoP-constrained growth model theoretically and empirically. The Chapter is organised as follows: Section 3.2 provides definitions of BoP and its components. Section 3.3 reviews BoP adjustment theories. Section 3.4 discusses the original Thirlwall's law and its extensions. Section 3.5 presents a critical analysis of selected empirical work on BoP-constrained growth model.

3.2 Defining balance of payment and its components

Before a discussion of BoP theories and its empirics, there is a need to understand the BoP itself and how its statistical data contents are presented (Gandolfo, 2016). This section reviews the definition and components of the BoP to understand how the domestic economy interacts with the rest of the world, since the BoP serves as the most important statistic in an open economy context.

3.2.1 Balance of payments

The International Monetary Fund ([IMF], 2009:9) defines the term BoP to mean "a statistical statement that summarizes transactions between residents and non-residents during a period typically one year". The transactions include the export and import of goods and services recorded in the goods and services account. Other transactions include investment income, transfers, movements of assets – such as foreign direct investments (FDI), investments in securities and other investments, debt foreign investment and international reserves. This systematic record of all the economic transactions of a country is normally captured in the domestic currency of the compiling country (Gandolfo, 2016). The BoP records international transactions in three categories of accounts, namely the financial account, the capital account and the current account. This division is based on the nature of the economic resources the country has provided and received.

3.2.2 The financial account

The financial account records transactions involving the "net acquisition and disposal of financial assets and liabilities" (IMF, 2009:133). The account has several classification criteria; however, of interest here is the criterion adopted by the IMF, which is based on the "nature of the operation, or type of capital: direct investment, portfolio investment, financial derivatives (other than reserves) and employee stock options, other investment, reserves" (Gandolfo, 2016:76). The definition of the financial account by the IMF is the same as the

definition of the capital account in the economic literature, which can be confusing. The IMF maintains that this difference in definition is consistent with the distinction between capital transactions and financial transactions, as appears in national accounts (IMF, 2009:216). The overall balance of the financial account is known as net lending/net borrowing. Net lending (the opposite of net borrowing) is when the economy supplies funds in net terms to the rest of the world. This considers the acquisition and disposal of financial assets, as well as the repayment and incurrence of liabilities.

3.2.3 The capital account

The IMF definition of a capital account "captures capital transfers receivable and payable between residents and non-residents, and the acquisition and disposal of non-produced, non-financial assets between residents and non-residents. These assets include land sold to embassies, and transfers of resources for capital requirements by one entity without a direct return of economic value to the supplying entity" (IMF, 2009:216).

3.2.4 The current account

The current account details all transactions that involve economic values (excluding financial transactions) undertaken by residents and non-residents. The recently updated IMF definition describes the current account as a measure of "flows of goods, services, primary income, and secondary income between residents and non-residents. The components of the current account are (i) the goods and services account, (ii) the primary income account, and (iii) the secondary income account." (IMF, 2009:9). These are discussed in detail below.

3.2.4.1 Goods and services account

The goods and services account record the transactions in items from production activities. It focuses on the point of exchange of goods and services by a resident and a non-resident. According to Gandolfo (2016), there previously were differences in values between imports recorded as c.i.f. (indicating an inclusion of cost, insurance and freight) and exports that were valued as f.o.b. (free on board, which means that the cost is only for the goods plus the cost of loading it into a carrier, e.g. a ship). Services are shown separately from goods.

3.2.4.2 The primary income account

The flows of primary income between residents and non-resident institutions are shown in the primary income account. "The flows are recorded in two accounts. The income account shows primary income generated in the production process, while the allocation of primary

income records primary income allocated to institutional units for the provision of labour, financial assets and national resources" (IMF, 2009:183). The international account has the following categories: - "(a) compensation of employees, (b) dividends, (c) re-invested earnings, (d) interest, (e) investment income attributable to policyholders in insurance, standardised guarantees and pension funds, (f) rents and (g) taxes and subsidies on products and production. This account has an impact on national income" (IMF, 2009:184).

3.2.4.3 The secondary income account

The current transfers (cash or kind) between residents and non-residents are captured in the secondary income account. This account reveals the income distribution process between economies. Secondary income, together with primary income, has a joint effect on the gross national disposable income (IMF, 2009:184).

3.3 Theoretical literature

3.3.1 The elasticity approach to BoP

The elasticity approach focuses on the balance of goods and services component of the BoP. It concerns exchange rate adjustment by examining the international terms of trade (or relative price) of a country based on the following relationship:

$$\pi = P_x/P_m r$$

where π is a relative price of foreign and domestic goods;

P_x is the export price of foreign and domestic goods;

P_m is the import price (in terms of foreign currency); and

r is the nominal exchange rate of the country.

Ceteris paribus, a change in relative prices of goods causes a change in demand in both the domestic and foreign market. This induces an alteration in the flow of imports and exports, thereby adjusting BoP disequilibrium. The elasticity approach is called a partial equilibrium analysis because it focuses on the variable of nominal exchange rate and assumes the other two variables in the relationship to be constant. The elasticity approach looks at the conditions of depreciation (or devaluation) of a currency to improve the economy's BoP through the current account component. It also considers how currency depreciation will affect the level of domestic activity. Finally, it also looks at how the devaluation affects the terms of trade of the devaluating country (Thirlwall, 2014).

It is important to recognise that it does not matter which exchange rate policy regime is being implemented; whether it is the expenditure switching policy, which aims at the restoration of BoP equilibrium, or the expenditure reducing policy, which induces a reduction in the total expenditure of residents, there is no variation in the effects of the exchange rate changes (Gandolfo, 2016).

3.3.2 The absorption approach to BoP

The current account is seen as either the difference between national income and absorption or the difference between national savings and investment. The absorption approach views BOP as the surplus after deducting the total receipts of residents from total payments. The absorption approach can be applied to both BOP as a whole and to the BOP on the current account (Thirlwall, 1982).

According to Gandolfo (2016), the relationship of national income, total aggregate demand and the BoP on the current account can be presented by the following equation: - $y = A + B$. By rearranging terms and applying rates of change, it becomes:

$$\Delta B = \Delta y - \Delta A$$

This accounting identity shows that the balance of payments (B) improves by devaluation if (i) absorption (A) is decreased (income being constant)

(ii) if income (y) is increased (absorption being constant) or

(iii) if both absorption and income increase provided absorption increases less.

According to Gandolfo (2016:459), based on the absorption approach, devaluation has the following main effects are: -

(i) Cash-balance effect: an increase in general price level due to devaluation causes a decrease in the real value of wealth. The public reacts by selling bonds and reducing consumption and investment (absorption).

(ii) Income-redistribution effect: redistribution of income occurs if devaluation causes a price increase. This redistribution has a consequence for absorption if the different categories of receivers of income do not have the same marginal propensity to spend.

(iii) Money-illusion effect: real income is static when there are equal proportional increases in prices and money income. However, due to the money illusion, the

public may be ignorant of this static condition and the result is a change in absorption, which takes either direction depending on the type of money illusion.

The following effects although minor are also important:

(i) Anticipation of further price increases, which forces the public to purchase goods to escape future high prices;
(ii) Reduction in investment due to a price rise of imported investment goods; and
(iii) Increased price of foreign goods, which results in a reduction in expenditure on foreign goods.

3.3.3 The monetary approach to the BoP

According to Gandolfo (2016:248), the monetary approach to the BoP (MABP) rests on the following basic propositions:

(i) Because the BoP is a monetary phenomenon, its analysis must be hinge on money stocks adjustment. The analysis must be based on the theoretical relationship between the demand and supply of money. This is obvious if BoP concerns monetary magnitudes, or if perceived BoP is fitted into the context of the accounting relationship (real and financial flows account matrix) in the whole economic system.

(ii) Governed by the purchasing power parity (PPP) equation, and based on the one-country hypothesis, goods and services must obey the law of one price, fixing the exchange rate and ignoring transport costs.

$$p = rp_f$$

where p is the domestic price level in domestic currency;

r is the exchange rate; and

p_f is foreign price expressed in foreign currency.

(iii) Because of price and wage adjustments, the production of an economy tends towards the full employment level.

These three propositions give rise to the following two important economic policy implications:

(i) Proposition 1: It implies that a monetary policy in a fixed exchange rate system will have no hold over the money supply of the economy. An attempt to manipulate money supply results in a BoP disequilibrium, and therefore "the divergence between the existing money stock and the demand for money will be unloaded" (Gandolfo, 2016:250).

(ii) The BoP disequilibrium is an automatic mechanism that is self-correcting and does not require intervention from monetary authorities. The only circumstance that permits policy intervention is in a fixed exchange rate regime during the self-adjustment process before achieving equilibrium when international reserves attain fatigue. The only allowed policy prescription is monetary restriction. Exchange rate devaluation must be avoided because it generates "purely transitory effects" (Gandolfo, 2016:250).

3.3.4 The BoP-constrained growth model

3.3.4.1 The original model and its extensions

BoP constraint is described as a condition in which the growth of a country is constrained at a rate below the required rate that will enable it to address its domestic economic problems. The constraint prevails because of the performance of the external market, as well as the global response to this performance. The country's BoP position "imposes a limit on the demand to which supply can adapt" (Hussain, 1999:104). This results into an economic growth constraint. The BoP-constrained growth rate model presupposes this BoP position as the main constraint on economic growth (Thirlwall, 1979). The foundations of the model are built on important elements of previous theories such as Harrod's foreign trade multiplier, the foreign exchange constraint of Chenery's two-gap model, the Hicksian 'super multiplier' and Prebisch's centre-periphery model (Thirlwall, 2011). A major factor that constrains growth of many poor countries is foreign exchange. An improvement of their export performance, coupled with a lower income elasticity of demand for imports, would make the poor countries grow faster (Thirlwall, 1979).

The basic BoP-constrained model starts off from the "proposition that no country can grow faster than the rate consistent with the BoP equilibrium on its current account, unless it can finance ever-growing deficits, which in general it cannot" (Thirlwall, 2011:321). Using the basic version of the model on a selected number of developed countries in two time periods, from 1951 to 1973 and 1953 to 1976, Thirlwall's original study, published in 1979, found a notable association between the actual growth of countries and the BoP-constrained growth model predicted growth rate (Hussain, 2009; Thirlwall, 2011). The extended version of the law, developed by Thirlwall and Hussain (1982), incorporates "terms of trade and capital flows seen as factors that might cause a country's growth rate to deviate from the rate predicted by the basic dynamic Harrod foreign trade multiplier" (Hussain, 1999:104).. Hussain (1999) applied this extended version (together with the basic form) by sampling

countries from Africa and Asia and was able to show that the extended form performed better in comparison to the basic form.

In its basic form, the BoP equilibrium growth model only captures a country's exports and imports with the rest of the world, which is contrary to the practical scenario, in which a country has many different import and export destinations. Nell (2003) formulated a disaggregated model to allow for several countries emphasizing on interdependence of economies.

Taking advantage of the nature of the basic model's aspect of aggregation of all imports and exports, Araujo and Lima (2007) used a structural economic dynamics framework of Pasinetti (1981) to come up with a disaggregated multi-sectoral version of the BoP-constrained growth model. Gouvea and Lima (2010) used the basic and multisectoral version of the law to test Argentina, Brazil, Columbia and Mexico, as well as Malaysia, Philippines, Singapore and South Korea. Using data over a period from 1962 to 2006, the authors categorised the economy into sectors. Each sectors export and import demand functions and an aggregate import demand function were estimated. Generally, the results point to the need for developing countries to transform their economies to sectors that have a higher income elasticity of demand for exports relative to imports as a precondition for the reduction of the income gap between them and developed countries.

Developing countries can finance BoP disequilibrium for significant time periods using capital inflows of various forms. Thus, Thirlwall's law can be extended to incorporate the aspect of capital inflows. Thirlwall and Hussain (1982) empirically show that developing countries that grew faster than predicted did so because of capital inflows, unlike the others that grew slowly due to the relative price movements which impacted negatively on the developing countries. However, the result of the basic Harrod trade multiplier differs little with the one that includes capital flows to finance current account deficits. This indicates that export growth, unlike capital inflows, remains the most significant variable as far as growth performance is concerned. Debt-creating capital inflows justifies the modification of the model to capture interest payments on debt. This result requires a separate analysis of the impact of interest payments and capital flows (Moreno-Brid & Pérez, 1999). Although the most suitable extension of Thirlwall's law is the one that incorporates sustainable deficits and debt, these capital inflows have little qualitative impact on the predictions of the basic Harrod trade multiplier result. Moreno-Brid (2003) considered the need to incorporate interest rates

to accommodate capital flows that accumulate debt. A modification to the model to incorporate capital flows is to isolate interest rates from capital flows. However, in all these proposed extensions, exports still dominate much more than the capital flows, hence the arguments still stand that exports are an important variable in as far as explaining growth performance is concerned (Thirlwall, 2011).

Although income elasticities of demand for exports and imports form the fundamental basis of BoP-constrained growth models, there are challenges in explaining the effect of the economic development of a country relative to other countries. North-South models, which are new-generation centre-periphery models (Prebisch, 1950; Thirlwall, 1983), recognise income elasticities of demand for exports and imports as a reference to a group of countries cognisant of whether they are developed or developing, or industrialised or non-industrialised (Thirlwall, 2011). This motivated Dutt (2002) to extend the basic Thirlwall law to better explain the disparities between developed and developing countries. The North-South extension of the model was developed from the intuition of Taylor (1981), who assumed two groups of countries in terms of savings, consumption and investment and the pricing dissimilarity of manufactured goods and primary commodities. The terms of trade of the North are derived simultaneously with those of the South. The long-run world economy growth rate is determined by the demand in the North.

3.3.4.2 Criticisms and defences of the BoP model

The first criticism is by McCombie (1981) who argues that Thirlwall's law "bordered on circular reasoning", with export and import income elasticities of demand and supply regarded as accounting identities. The argument is that the law only differs from this accounting identity upon inclusion of the condition that exports growth rate (x_t) equals imports growth rate (m_t)

McGregor and Swales (1985, 1986, 1991) advance three more criticisms. The first argument hinges on the neo-classical law of one price. Thirlwall's law states that, due to arbitrage, similar tradable goods and services are transacted at the same price (plus transport costs) in a common currency. This results in minor relative price movements. The implication of the law of one price for a small country is infinite price elasticities of demand for exports, and therefore BoP will not constrain growth.

McGregor and Swales (1986) criticism concerns the statistical testing of the law. The argument is that the association between the BoP-constrained growth and the actual growth

rate that was originally tested using Spearman's rank correlation coefficient should rather be tested using regression analysis. The authors show that testing a regression from their proposal that the predicted income growth rate should be the dependent variable in the regression results in the rejection of the null hypothesis. In response to this criticism, Thirlwall (2011) observes that the assumption that all countries are part of the total sample cannot work theoretically or empirically (including all countries in the sample is assumed to add to zero the sum of deficits and surpluses). In McGregor and Swales (1986) criticism, the authors developed a technique of individual country testing of the hypothesis.

The final criticism concerns the dynamism of export market shares and the fact that the model does not consider non-price competitiveness. McCombie (2011) observes that the criticism of non-price competitiveness does not hold because it is dealt with by the estimated income and export elasticities.

Palley (2003) argues that the model has no mechanism to reconcile demand and supply growth. According to the author, the model "has fallen into the pitfall of failing to properly account for the supply side" (Palley, 2003:115). In the long run, the dynamic current account is not the only restriction on growth, but also balancing the equation between the growth rate of output and the rate of growth of capacity. As a result, potential inconsistencies result in trying to balance both the current account and capacity requirement. To deal with this problem, import bottlenecks must be incorporated. Imports have several constraints that become more widespread when unemployment decreases and excess capacity rate decreases. Hence, to reconcile this criticism, growth without full employment must be permitted by recognising that "steady state excess supply conditions can affect the steady-state rate of growth" (Palley, 2003:80).

Setterfield (2006, 2011) provides appropriate defences to Palley's (2003) criticism. The defence incorporates supply-side factors to deal with a potential discrepancy between the BoP equilibrium growth rate and the possible growth given by the supply side. Of course, this arrives at other implications than advanced by the criticism: "the long run growth rate is still determined by the BoP equilibrium growth rate as in Thirlwall's Law, contrary to what is implied in the criticism" (McCombie, 2011:368).

3.4 Empirical evidence

This section critically analyses the empirical evidence of both the BoP adjustment mechanisms models and the BoP-constrained growth model.

3.4.1 Empirics of balance of payments adjustment mechanisms in Malawi

3.4.1.1 The J-curve effect

At several times in its economic history, Malawi has devaluated the Malawi Kwacha in the hope of improving the economy's trade balance as predicted in international trade theory. Mataya and Veeman (1997), motivated by the failures of the economy to respond favourably to relative price changes resulting from currency devaluations, sought to establish whether the J-curve effect resulted in an alteration in Malawi's trade balance from the devaluations that took place since 1980s. The study used the Almon distributed lag model to test the hypothesis that, after currency devaluation, Malawi's adjustment process followed the J-curve. The results of the study differed from the hypothesis, indicating that after currency devaluation the trade balance did not improve as expected through changes in the real exchange rates. Furthermore, the results reveal that a 1% increase in the real domestic income corresponds to a 0.5% reduction in the trade balance. Another observation was that there was no significant effect on trade balances due to changes in real foreign income. The authors conclude that this is due to Malawi's export products, which are primary in nature.

Another study on the J-curve hypothesis was done by Hussain and Haque (2014) on a set of panel data for 49 sub-Saharan countries (including Malawi). The aim of the study was to establish whether there is evidence supporting the J-curve hypothesis. The authors studied the relationship between trade and changes in exchange rates. Three different panel data models, namely the fixed-effects model with time-specific dummy variables, the random-effects model and the system dynamic panel data model (the Arellano-Bond model), were used in the study. The fixed- and random-effects models generated results that exhibited a negative relationship between the variables (an increase in exchange rate resulted in a trade balance deterioration). The trade balance component that suffered was the exports component. However, the system dynamic panel data estimation generated a positive relationship between the variables. The authors concluded that the J-curve proposition holds in the long run; that is, there is no deterioration in the trade balance when local currency is depreciated.

3.4.1.2 The monetary approach

The undeveloped nature of money and stock markets in SSA makes the application of the monetary approach a strongly debated policy tool for analysis. However, it becomes an alternative tool if we consider that there are many diagnostic tools for the BoP problems faced by economies in the world, not only the Malawi economy. One of the key studies emanating from this reasoning is by Silumbu (1995), who sought to address the research gap

that exists in the evaluation of the monetary approach to the BoP (MABP) in SSA. Using Malawi as a case study, the researcher explored the implication of the role of exchange rate, relative prices and credit policies in shaping the BoP. The basis of the study was the MABP model, which assumes that there is a stable, long-run demand for money (L), and that it has a positive relationship with domestic price level (P_d) and real income (y). However, the long-run demand for money has a negative relationship with the interest rate (r). The first striking result is the importance of relative prices, which revealed that the current account dominates Malawi's BoP. Secondly, the interest rate variable inhibited a significant relationship to the overall BoP. This is despite Malawi's financial sector not yet being well incorporated in the world financial system. However, the author treats these results as just useful observations, but concludes that, in the context of Malawi, the MABP generates defective results if interpreted based on quarterly data, while on the basis of annual data the results show that the MABP approach may still be a valid tool of analysis in the Malawi context.

3.4.2 Empirical evidence of BoP-constrained growth models

There is a large body of literature that empirically tests the BoP-constrained growth model. The original BoP-constrained growth model was applied to developed countries over two overlapping time periods. The first was from 1951 to 1973 and the second was from 1953 to 1976. (Thirlwall, 1979). The result of the study showed that actual growth of countries and the predicted BoP-constrained growth model growth rate correspond. Many studies on the model have emerged since this original model was tested. The studies test both individual as well as groups of countries.

The basic BoP-constrained growth model is tested by Ozturk and Acaravci (2010), who investigate the economic growth of South Africa. Using data for the period 1984 to 2006, the results show that South Africa's imports are cointegrated with relative price and domestic income. The results also show that the BoP equilibrium growth rate corresponds with the actual growth rate. These findings support the Thirlwall (1979) hypothesis that South Africa's BoP constrains the economy's growth.

Atesoglu (1993) was amongst the first to use the Thirlwall and Hussain (1982) version, which includes real capital flows as one of the independent variables, to study Canada's economy. The study used regression analysis and found that export growth was main determinant of economic growth in Canada.

Hussain (1999) did a comprehensive study using the Thirlwall and Hussain (1982) extended model to contrast the economic growth rates of African and East Asian countries from the 1970s to 1990s. Two methods were used, namely the modified McGregor and Swales (1985) method and the McCombie (1989) individual-country method. The results show that African countries have low growth rates resulting from the low magnitudes of their dynamic Harrod foreign trade multiplier. The poor performance of countries in Africa is attributed to their overreliance on primary products for export.

Onakoya (2015) examined Nigeria's long-run growth performance using the same version of the BoP-constrained growth model covering the period 1980 to 2012. The short-run dynamics and the long-run dynamics were tested using the ARDL approach to cointegration. The author found that growth in terms of trade, real exchange rate and capital flows played little or an insignificant role in determining Nigeria's economic growth. Export growth was found to be the most important variable explaining the economic growth of Nigeria.

Empirical research on Thirlwall's law is also available for developing countries in Asia. Tharnpanich and McCombie (2013) used a time-series analysis of Thailand over the period 1962 to 2009 that recognised the existence of a structural break. The authors concluded that Thailand's long-run economic growth is BoP constrained. Jeon (2009) tested the validity of Thirlwall's law in China during the reform period of 1979 to 2002. The results confirm the significance of a demand-driven explanation of economic growth in the country. In Pakistan, Felipe et al. (2010) examined the extent to which the country's growth is constrained by the BoP. Their results show that Pakistan's growth rate of 5% per annum was below the economy's potential (between 7% and 8% per annum).

Perraton (2003) tested whether Thirlwall's law holds for 51 developing countries including Malawi over the period 1973 to 1995. Reasonable estimates could not be derived for 19 countries, including Malawi. Unreasonable estimates resulted from many developing countries' poor quality of data. It was also concluded in the study that capital flows were inefficiently used, especially in the 1970s, resulting in failures of Thirlwall's law to hold in these countries. Based on the study, the predicted growth rate shows that the hypothesis that the "estimated income elasticity of demand for imports is equal to the value required to make the estimated growth rate equal to the actual growth rate cannot be rejected" (Perraton, 2003:10).

3.5 Conclusion

The review of the literature in this chapter has provided important definitions of the BoP and its components, namely current account, capital account and financial account. This chapter has discussed the theoretical literature on mainstream growth theory and the BoP-constrained growth model. The chapter also outlined empirical evidence of the applicability of Thirlwall's law.

CHAPTER 4: RESEARCH METHODOLOGY

4.1 Introduction

This chapter presents the methodology that will be used to empirically test the Thirlwall's law for Malawi. Firstly, the theoretical framework is outlined, followed by the econometric specification. The first section discusses the BoP-constrained growth model, which is the backbone of this dissertation. The subsequent parts of the chapter discuss the empirical model, the data used and the estimation techniques. The last section presents descriptive statistics and discusses the interaction of the import, income and terms of trade variables over the period 1980 to 2017.

4.2 The balance of payments-constrained growth model (BPCGM)

The foundation of this dissertation is built on the BoP-constrained growth model. The study adopts the extended version of the BoP-constrained growth model initially proposed by Thirlwall and Hussain (1982) but popularised by Hussain (1999). The starting point of the model is three equations. The first one is the export demand function, and the second is the import demand function. Equations (1) and (2) describe the behaviour of exports and imports respectively. The third equation is the balance of payments equilibrium, which has functional multiplicative forms and constant elasticities (Thirlwall, 1979). The equations, given in growth rates, are as follows:

$$x_t = \eta(P_{dt} - P_{ft} - e_t) + \varepsilon(Z_t) \quad (1)$$

$$m_t = \psi(P_{ft} + e_t - P_{dt}) + \pi(y_t) \quad (2)$$

$$P_{dt}X_t + C_t = P_{ft}M_tE_t \quad (3)$$

where X_t is the volume of exports, P_{dt} is the domestic price of exports, $P_{dt}X$ is the domestic currency value of exports, M_t is the volume of exports, P_{ft} is the average foreign price of imports, and E_t is the nominal exchange rate measured as the domestic price of foreign currency. An increase in E_t indicates a depreciation in foreign currency, E converts $P_{ft}M_t$ into a domestic currency equivalent, and C_t is the value of capital flows expressed in domestic currency.

Differentiating the logs of equation (3):

$$\frac{X}{M}(P_{dt} + x_t) + \frac{C}{M}(C_t) = P_{ft} + m_t + e_t \quad (4)$$

where $\frac{X}{M}$ is the ratio of exports to imports, and $\frac{C}{M}$ is the ratio of capital flows to imports. Lower case letters depict growth rates.

Substituting with the export and import demand functions as outlined in (1) and (2) generates the equation that is used to estimate the BoP constraint to growth, with the initial current account shortfall compensated by capital inflows:

$$y^* = \left[\left(\frac{X}{M}\eta + \psi\right)\left(P_{dt} - e_t - P_{ft}\right) + \left(P_{dt} - P_{ft} - e_t\right) + \left(\frac{X}{M}\right)\left(\varepsilon(\mathrm{Z})\right) + \left(\frac{C}{M}\right)\left(C_t - P_{dt}\right)\right]/\pi \quad (5)$$

$$y^* = \left(\frac{X}{M}\right)\left(\varepsilon(\mathrm{Z})\right) + \left(\frac{C}{M}\right)\left(C_t - P_{dt}\right)/\pi \quad (6)$$

$$y^* = \left(\frac{X}{M}\right)x_t + \left(\frac{C}{M}\right)\left(C_t - P_{dt}\right)/\pi \quad (7)$$

The interpretation of equation (7) is that the equilibrium growth rate, which initially has current account imbalances and a BoP constraint on the economy's growth, is the arithmetic sum of weighted values of exports and capital flows to the coefficient of income elasticity of imports. A higher equilibrium growth rate results when the coefficient of income elasticity of imports is low (Thirlwall & Hussain, 1982).

It should be noted that, in equation (5) of the extended Harrod foreign trade multiplier, if $P_d = P_f + e$, "that is if relative prices measured in a common currency remain unchanged, the current account is balanced and there are no capital flows, the BoP-constrained real income growth" () gets back to its basic form:

$$y^{**} = \varepsilon \mathrm{Z}_t/\pi \quad (8)$$

$$y^{**} = x_t/\pi \quad (9)$$

4.3 Empirical analysis

The methodology of the study has been adapted to suit the characteristics of the Malawian economy. The steps of the empirical analysis are as follows:

(1) Assessment of the elasticity of import demand
(2) Testing the applicability of the basic and extended form of Thirlwall's law

The import demand function is estimated empirically using the following log transformation:

$$logM = loga + \psi \log(tot) + \pi log(Y)$$

The variables used in the empirical analysis are formulated as follows:

Volume of imports (logM)

The natural logarithm of imports of Malawi is in current United States dollar values

Net terms of trade (logtot)

The natural logarithm of net terms of trade

GDP of Malawi (logY)

The natural logarithm of GDP of Malawi in current United States dollar values.

Net capital flows

The sum of net foreign direct investment (FDI) and portfolio investments.

4.4 Data sources

The data for imports, income, terms of trade, FDI and portfolio investments were obtained from the World Development Indicators of the World Bank (2018). The data is from 1980 to 2017. The initial preference was to have a long time period, but missing data values for these variables limited the scope to the chosen period.

4.5 Estimation technique

4.5.1 Unit root test

The use of the auto-regressive distributed lag (ARDL) model requires a check of the order of integration, which is achieved by testing for the unit root. If a series has a unit root or is non-stationary, regressing the series against another non-stationary variable results in a spurious regression. Although the spurious regression might have a high R^2 and significant *t*-statistics, the results may not make economic sense. The regression will have good output results, but inconsistent least-squares estimates. Additionally, the traditional tests of statistical inference, such as the t- and F-statistics, will not hold (Enders, 2015).

The Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests are used to test the null hypothesis that each of the variables in the study is non-stationary or has a unit root. The alternative hypothesis is that each variable is stationary and has no unit root. The stationarity of a variable at levels means that the variable is integrated of order zero (I (0)). If a series is stationary at first difference and at second difference, then the variable is integrated of order

one (I(1)) and order two (I(2)) respectively (Dickey & Fuller, 1981; Phillips & Perron, 1988). The uniqueness of the ADF test is that of adjusting the DF test to overcome any probability of serial correlation in the error terms (Pesaran & Shin, 1999). The adjustment is done by including the lagged difference terms in the regressand. Although the asymptotic distribution of both tests is the same, the PP test does not add lagged difference terms, but rather uses "nonparametric statistical methods" (Gujarat & Porter, 2009:758).

4.5.2 Auto-regressive distributed lags/bounds testing

According to Pesaran and Shin (1999), the auto-regressive distributed lag/bounds-testing (ARDL) methodology is advantageous over other cointegration tests because of the simplicity to implement and interpret its results because of the single-equation setup and the assignment of different lag lengths to different variables entering the model. This approach is also applicable whether underlying regressors are purely I(0), purely I(1), or mutually cointegrated. The use of the ARDL is also advantageous when determining co-integration relationships because of its good small sample properties (Ghatak & Siddiki, 2001) compared to the Johansen cointegration technique after determining the lag order of the model. The bounds test does not require variable pre-testing. The choice of the ARDL is therefore appropriate given the small sample size of the dataset used for the study.

The model to be estimated using the ARDL framework is as follows:

$$\Delta m_t = \alpha_0 + \sum_{i=1}^{k} \rho_i \Delta m_{t-1} + \sum_{i=1}^{k} \pi_i \Delta y_{t-1} + \sum_{i=1}^{k} \varepsilon_i \Delta(tot)_{t-1} + \beta_1 m_{t-1} + \beta_2 y_{t-1} + \beta_3 (tot)_{t-1} + \mu_t$$

where μ_t is a white noise error term, Δ is the first difference operator, k is the optimal lag length, and α_0 is the intercept.

This dissertation performs empirical analysis using EViews10 due to the availability of the ARDL estimation technique as well as model diagnostic tests. The diagnostic tests that were conducted in this study are the Breusch-Pagan-Godfrey test to check for heteroscedasticity, the Breusch-Pagan test for autocorrelation, the Jacque-Bera normality test to check for normality, the Ramsey RESET misspecification test to check whether the model is well specified or not, and the cumulative sum (CUSUM) and cumulative sum of squares (CUSUMSQ) tests to test model stability.

4.6 Descriptive statistics

This section presents the descriptive statistics in the form of histograms of the series of imports, the Malawi GDP and terms of trade as presented in Table 4.1. For the series of variables, skewness, which for a normally distributed variable must be 0, is 0.721, 0.766 and 0.974 respectively, whereas kurtosis, which should ideally be 3, is a measure of the tallness or squatness of the normal distribution. The kurtosis of the respective variables is 1.922, 2.177 and 2.902. The JB statistic of the Jarque-Bera test is about 5.138, 4.79 and 6.017 respectively. The JB test of normality is a test of the joint hypothesis that $S = 0$ and $K = 3$. When this is the case, the value of the JB statistic is expected to be 0.

Table 4.1: Descriptive statistics

	Imports	GDP	Terms of trade
Mean	1.13e + 09	3.14e + 09	120.5765
Median	7.47e + 08	2.14e + 09	109.2517
Maximum	2.51e + 09	8.00e + 09	200.0000
Minimum	2.96e + 08	1.13e + 09	78.96115
Standard deviation	7.82e + 08	2.08e + 09	33.96497
Skewness	0.721539	0.766108	0.973538
Kurtosis	1.921665	2.176563	2.901608
Jarque-Bera	5.138359	4.790751	6.017912

Source: Own calculations from data obtained from World Development Indicators (World Bank, 2018)

4.7 Variable trends

It is a general practice in time-series analysis to plot the log of a time series to get a pointer of the growth rate of the series under study. Figures 4.1, 4.2 and 4.3 plot imports, Malawi GDP and terms of trade respectively over the period 1980 to 2017. As can be seen from the visual plots, the variables of imports and Malawi GDP seem to be trending upward, with an observable presence of fluctuations. However, the behaviour of the variable, terms of trade, is different. It depicts a downward trend that drops significantly over the years and picks up slightly towards the end of the observation.

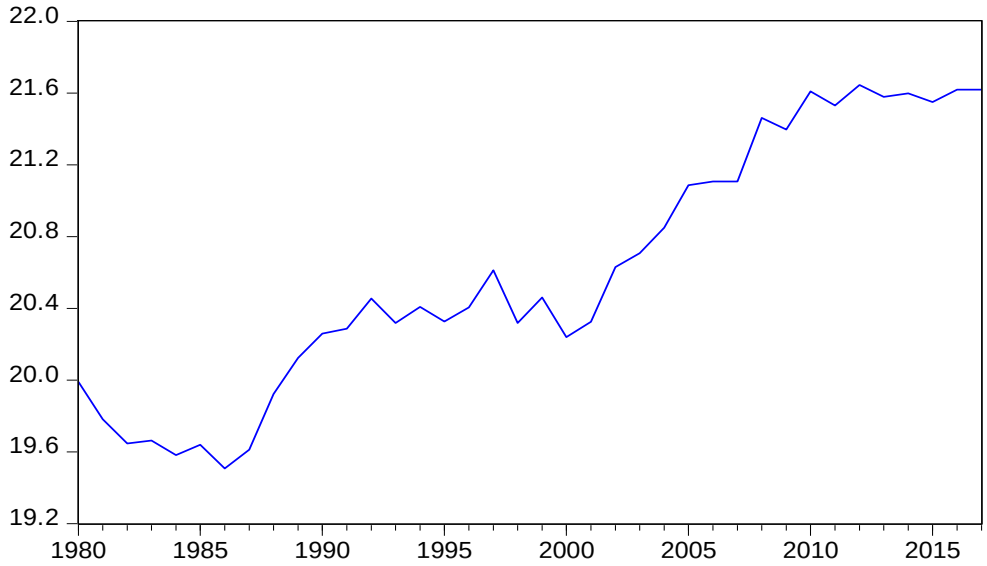

Figure 4.1: Malawi imports (1980 to 2017)

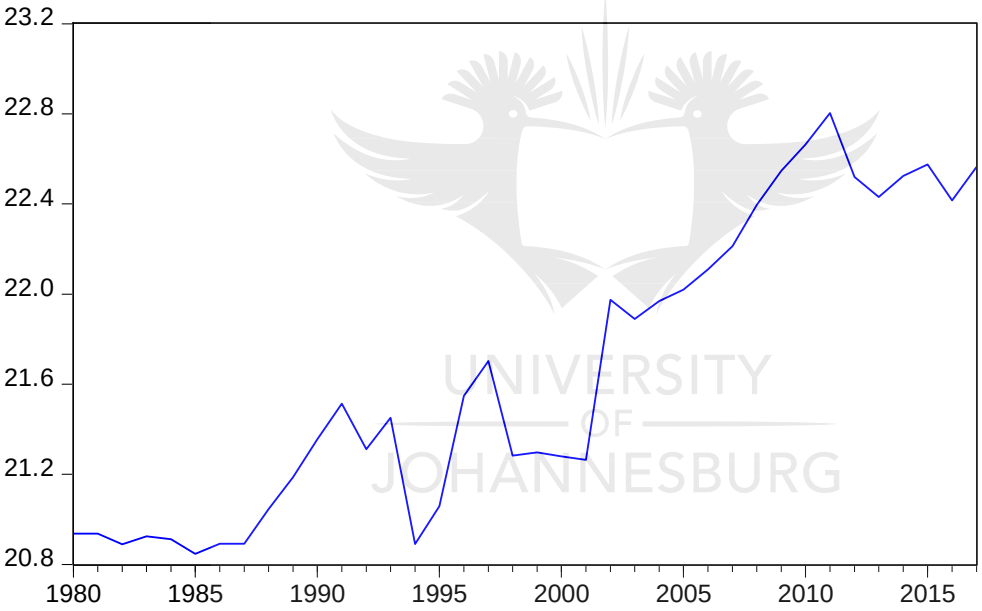

Figure 4.2: Malawi GDP in current US dollar values (1980 to 2017)

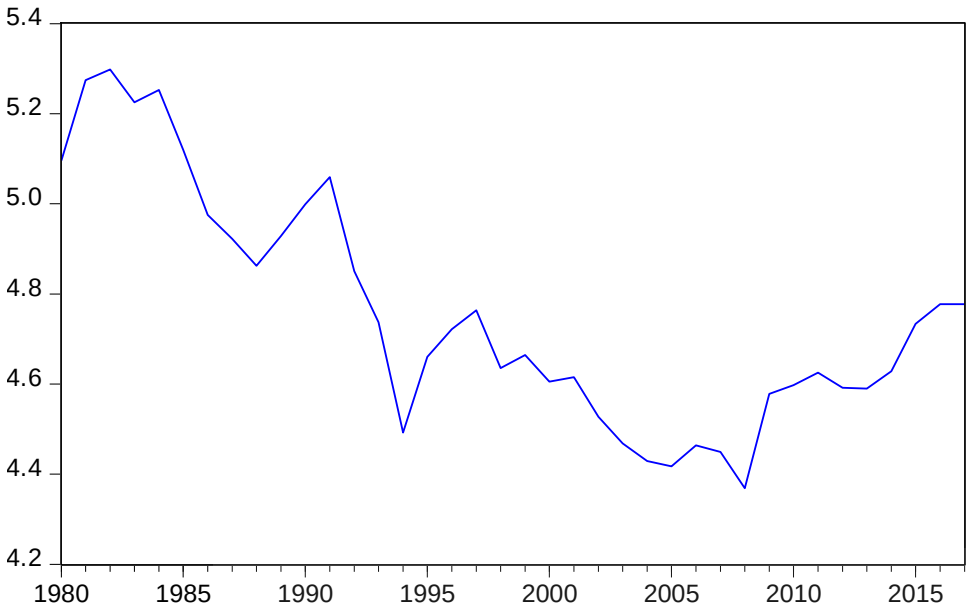

Figure 4.3: Malawi terms of trade (1980 to 2017)

4.8 Cross-correlation of variables used

Table 4.2 below shows the correlation between the variables under analysis. Imports (variable of interest) is positively correlated with domestic income and negatively correlated with terms of trade.

Table 4.2: Correlation matrix

Correlation probability	**logM**	**Logtot**	**logY**
logM	1		
LogToT	-0.693632	1	
logY	0.964674	-0.625750	1

Source: Author's computation using EViews10

Figure 4.4 shows the scatter plot relationship between logM and logY. The two variables are positively correlated, which implies that domestic income increases when imports are also high.

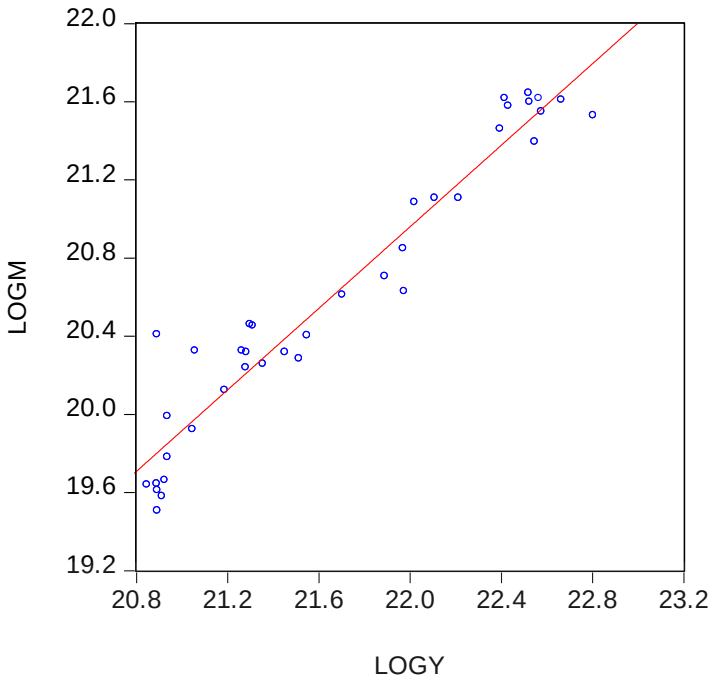

Figure 4.4: Correlation between imports and domestic income

4.9 Concluding remarks

This chapter has formalised the relationship between imports as a dependent variable and domestic income and terms of trade as independent variables within the theoretical framework of Thirlwall (1979). The data cover the period 1980 to 2017. The source of the data is the World Development Indicators (World Bank, 2018). The chapter also introduced the ARDL approach, which was used to estimate the BoP-constrained growth model. The trends of the variables of interest have also been depicted.

CHAPTER 5: EMPIRICAL RESULTS AND DISCUSSION

This chapter presents and interprets the estimation results of the study. A chronological discussion of the diagnostic test results is also given. The last section of the chapter discusses the regression estimations.

5.1 Unit root test

The variables' properties were tested for unit root using both the augmented Dickey Fuller (ADF) unit root test developed by (Dickey & Fuller, 1981) and the Phillips-Perron (PP) unit root test developed by (Phillips & Perron, 1988). The unit root test is necessary because most economic theories posit non-stationary relationships among economic series, which result in spurious regressions (Granger & Newbold, 1974). The results of the unit root tests which are presented in Table 5.1 indicate that all variables import (log of imports), gross domestic product (log of GDP) and terms of trade (log of terms of trade) are integrated of order one. The model achieves almost efficient and unbiased estimates when each variable is in its first-difference form (Patterson, 2011).

Table 5.1: Results of ADF and PP unit root tests

Augmented Dickey Fuller (ADF) test				Phillip-Perron (PP) test		
Variable	Level	1st difference	Status	Level	1st difference	Status
L-Imports	-0.208607	-6.981365***	I(1)	-0.176053	-6.923631***	I-(1)
L-GDP	-0.808470	-6.472001***	I(1)	-0.507365	-8.100727***	I(1)
L-Terms of trade	-1.511687	-4.413015***	I(1)	-1.434394	-5.670443***	I(1)

Note: *** Denotes significant at all levels (1%, 5% and 10%)

5.2 Bounds tests for cointegration

The bounds test results are presented in Table 5.2. The F-statistic is 9.97, which is far much above the critical value of the upper bound of 6.36 at the 1% level and means that there is a long-run association amongst the variables for the explanation of Malawi's imports. This allows us to proceed to estimate the long-run speed of adjustment. The derived long-run coefficients of the ARDL (3, 0, 0) model are captured in Table 5.3.

Table 5.2: Bounds test for cointegration results

Dependent variable	Test statistic	Value[a]	Critical value bounds			Conclusion
			Significance	I (0)	I (1)	
GDP (logY)	F-statistic *K*	9.974634 2	10% 5% 2.5% 1%	3.17 3.79 4.41 5.15	4.14 4.85 5.52 6.36	There is a cointegrating relationship

[a] EViews 10 output and [b] Pesaran et al. (2001)

Note: Pesaran et al. (2001) describe k as the number of regressors. In this study, the regressors are two, hence k = 2

Table 5.3: Estimated long-run coefficients

Variable	Coefficient	Std. error	t-Statistic	Prob.
LogY *Logtot*	0.969008	0.079275	12.22336	0.0000
	-0.530759	0.224049	-2.368943	0.0247

The estimated long-run coefficients show that domestic income (*logY*) is highly significant and positively correlated with imports, *logM*, in line with theory. *Ceteris paribus*, a 1% increase in domestic income increases imports by 0.969%. The terms of trade (*logtot*) are significant and negatively associated with imports. This implies that terms of trade have an impact on Malawi's imports.

Table 5.4: Error correction model estimates

Dependent variable: imports (ΔlogM)				
Variable	Coefficient	Std. error	t-Statistic	Prob.
C	0.970710	0.162947	5.957207	0.0000
$\Delta logM_{t-1}$	-0.274153	0.118941	-2.304936	0.0285
$\Delta logM_{t-2}$	0.173113	0.113480	1.525494	0.1380
ecm_{t-1}*	-0.438126	0.077466	-5.655760	0.0000
R-squared		0.559998		
F-statistic		13.15140		

*p-value is incompatible with t-bounds distribution

Based on the results of the model, the import demand function of Malawi for the period 1980 to 2017 is as follows:

$$m_t = 0.97y_t - 0.53ToT_t$$
$$(-2.37) \quad (12.223)$$

Theoretically, the import demand function elucidates that an increase in the terms of trade leads to a reduction in import demand, and an increase in the growth rate of domestic income (y) leads to an increase in the demand for exports. The estimated coefficients of the long-run relationship are significant and bear the theoretically expected sign of the import demand function. The results show that the demand for imports with respect to income is less proportionally elastic (0.97) and inelastic with respect to terms of trade (-0.53). The income elasticity of imports is found to be significantly positive, as postulated by Thirlwall's law, and the results show that a 1% increase in GDP will generate a proportionate but positive 0.97% increase in imports and vice versa. An increase in Malawi's economic growth leads to a rise in imports in the long run. The terms-of-trade coefficient confirms Thirlwall's law. Following the law of demand, the terms of trade are negatively related to imports.

The basic form is calculated by dividing exports growth rate of 8.917 % (mean value over the 1980-2017 period) over estimated income elasticity of 0.97. The model predicts an annual growth rate of 9.913%. The average GDP growth rate for Malawi for the period is 3.548%. The result shows that the predicted growth rate exceeds the actual growth with a difference of 6.365. The basic form does not include the importance of the capital flows in the BoP equilibrium. Its omission leads to differences between the growth that the law predicts and the actual growth of Malawi. The extended version predicted domestic growth rate is 5.79%. Thirlwall (1979) indicates that there are two situations which shows that economic growth of a country is BoP constrained. The first scenario is the actual growth rate is less than the growth predicted by theory. The second case is when there is statistically no difference between predicted growth rate and the actual growth rate. Since our results show that the actual growth rate is lower than the predicted growth rate, the interpretation is that Malawi is BoP constrained. This means that the country cannot grow beyond the constraint imposed by the BoP.

5.3 Diagnostic test of the ARDL model

Table 5.5: Diagnostic tests

Test	F-statistic	P-value
Heteroscedasticity	1.437667	0.2406
LM serial correlation	0.2967787	0.7456
Normality	0.428868	0.8614

Table 5.5 reports the results of diagnostic tests for heteroscedasticity, serial correlation, normality and functional form. The F-statistic generated from the Breusch-Pagan-Godfrey test is 1.437667 and has a p-value of 0.2406. We fail to reject the null hypothesis and conclude that the estimators of the coefficients are efficient. The LM serial correlation test gives an F-statistic of 0.2967787 with a p-value of 0.7456. The interpretation of this result is that the hypothesis of no first-order correlation is not rejected by the model, which indicates the efficiency of the estimators of the coefficients. The Jarque-Bera test for normality is governed by the null hypothesis of normal distribution of the residuals. If the computed p-value is significantly low, the hypothesis is rejected. If the p-value is high, the normality assumption is not rejected. The results of the Jarque-Bera test give a F-statistic of 0.428868 and a p-value of 0.8614.

In addition to the diagnostic tests, CUSUM and CUSUMSQ are used to check the stability of the ARDL model. Figures 5.1 and 5.2 presents the results graphically. In both figures, the lines lie within the critical bounds of the 5% significance level, which means that the model is stable.

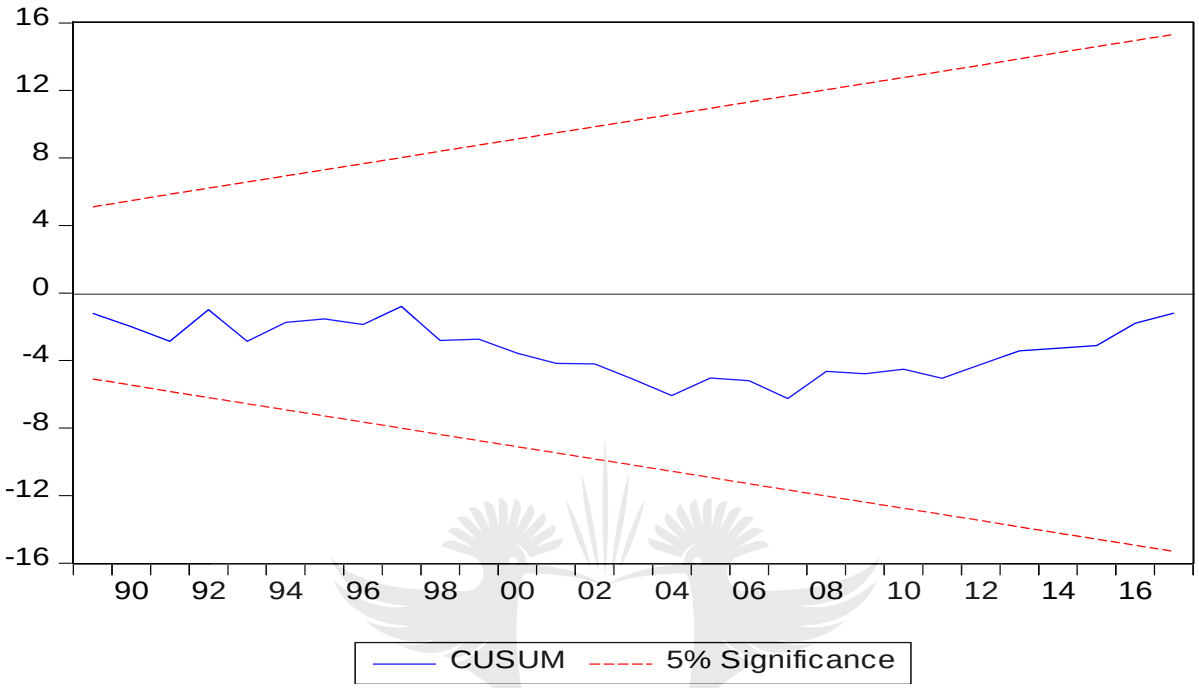

Figure 5.1: Plot of CUSUM statistics for coefficient stability test

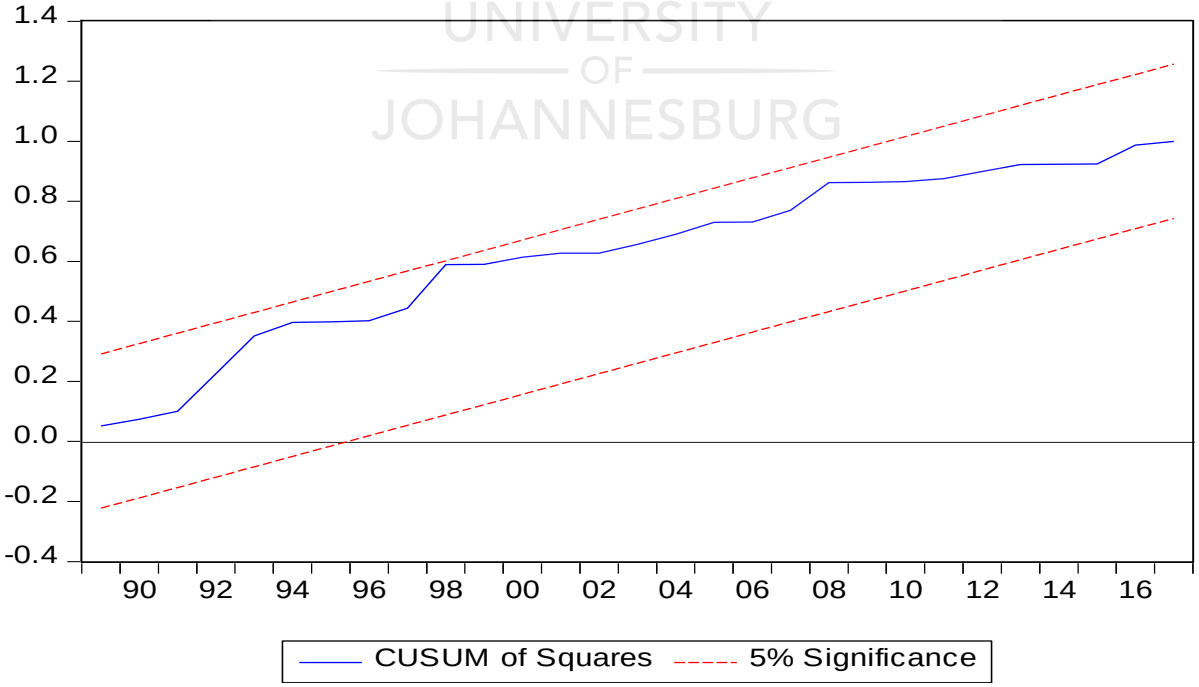

Figure 5.2: Plot of CUSUMSQ statistics for coefficient stability test

5.4 Conclusion

This chapter has presented and discussed the results of the study. The primary objective of the study was to empirically establish Thirlwall's law's validity for the Malawi economy. In order to achieve the research objectives, the ARDL was used to investigate the long-run relationship between imports and two determinants, namely domestic income and terms of trade.

The results for cointegration show that imports, domestic income and terms of trade are cointegrated. The estimated long-run coefficients reveal that imports and domestic income are positively correlated. The results also show that imports and terms of trade have a negative association.

The results suggest that increasing the domestic income of an economy increases its imports, while an increase in terms of trade reduces imports.

Chapter 6: CONCLUSION

The dissertation analysed the structural trade imbalance of Malawi by estimating the relationship between imports, terms of trade and the country's growth rate for the period 1980 to 2017 using Thirlwall's law. Researchers have undertaken similar studies of Thirlwall's law by employing the original version, as well as extensions made to the original model. The ARDL approach was used to estimate the import demand function for Malawi. The income elasticity derived from the import demand function and the average export growth rate over the period 1980 to 2017 were used to calculate projected income growth rates based on the simplified version of the law. However, because the simple model does not incorporate capital flows and the extended version is more appropriate.

6.1 The main arguments and findings of the dissertation

The analysis of the key determinants of imports as proposed by Thirlwall's law, namely domestic income and terms of trade from 1980 to 2017, has revealed that imports and domestic income positively associate in the long run. The estimated income elasticity shows that an increase in domestic income increases import demand, thereby positively impacting the trade balance. *Ceteris paribus*, a 1% increase in Malawi's domestic income will increase import demand by 0.969%. The terms of trade, however, have a negative and significant association with imports. An increase in terms of trade reduces import demand. The average export growth rate of 8.917% between the period 1980 and 2017, and the income elasticity of 0.91 derived from the import demand function, were used to make growth rate predictions. Thirlwall's basic law predicts a growth rate of 9.913%, while the extended version, which incorporates capital flows, predicts a growth rate of 5.79%. The actual growth rate for Malawi over the study period is 3.548%. As can be seen, the basic and extended versions of the model overvalue Malawi's economic growth as compared to the actual growth rate.

6.2 Policy recommendations

There are two important policy approaches that target improvement Malawi's trade balance position. The first is an economic policy that reduces the income elasticity of demand for imports, which would allow the relaxation of the BoP constraint on growth, thus allowing Malawi to accelerate its growth rate. This can be done by promotion of consumption of products produced in Malawi. The composition of imports needs to be re-organised so that a great share comprises intermediate imports. The second policy prescription is to implement policies that aim at increasing exports. This could be done through the introduction of

policies that aim at increasing volumes, quality and standards of the country's products. The resultant export growth is advantageous because it will minimise the country's propensity to export, thereby relaxing the BoP constraint and eventually make the economic growth rate to go up. The trade imbalance can be corrected if Malawi develops new export clusters to complement the tobacco cluster. Exporting value-added products is the only sure way of ensuring that exports catch up with imports, thereby correcting the trade deficit problem.

6.3 Areas for further research

Further research can take advantage of other extensions of Thirlwall's law, such as Moreno-Brid and Pérez's (1999) model, which captures interest payment on debt. This is because the extended version, which incorporates capital flows, has an overvalued projected growth rate compared to the simple model since it does not include the impact of interest rates in its analysis. This furthermore suggests that debt, and not only capital flows, is important in analysing growth dynamics.

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